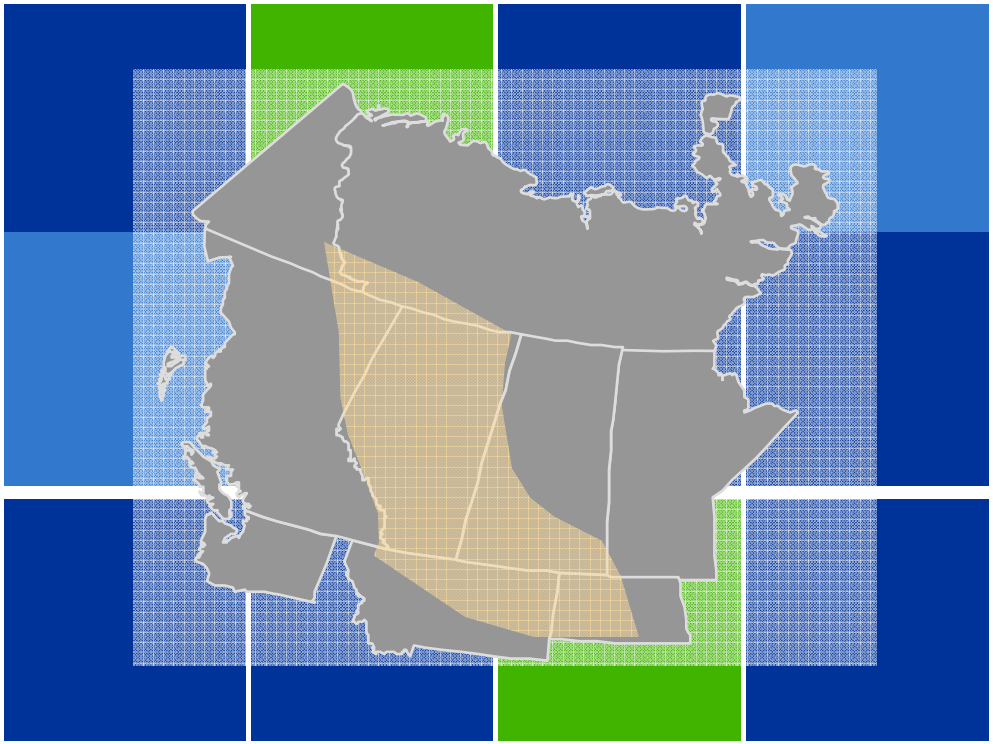

Supply Cost Methodology

CEC Workshop December 16, 2004

Supply Forecasting

Walter DiMattia

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In business to deliver

Why does TCPL calculate supply costs?

Answer: Supply Forecast for our long lived assets

Strategic needs – Annual North American supply demand outlook

- Determine flows on various TCPL segments
- Opportunities/Competitor issues
- Northern Gas/LNG/Unconventional
- Better understand our customers (E&P industry)

Regulatory

- Depreciation
- Business Risk

Operational

- Facility solutions (Looping vs Compression)

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What makes TCPL supply forecast unique?

TransCanada has:

- Customer transportation contract information
- Customer discussions/plans
- Relationship with storage operators

So what?

- We have another perspective on the industry

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What's different about how TCPL does supply costs?

- Pool Size Distribution
  - Doubly Truncated Lognormal
  - Pool Size Distribution reflects smaller pools
  - Economic truncation
- Discovery Process (Finding Rate Analysis)
  - Exploration Efficiency
  - Biased Sampling without Replacement
- Blended Supply Cost Curve
  - Not Perfect Foresight
- Technology adjusted
  - 2% per year improvement in costs

Pool Size Distribution

- Large undiscovered pools determined by peer review
- Under biasing for small pools (economic truncation)
- Low and high sensitivities of ultimate potential

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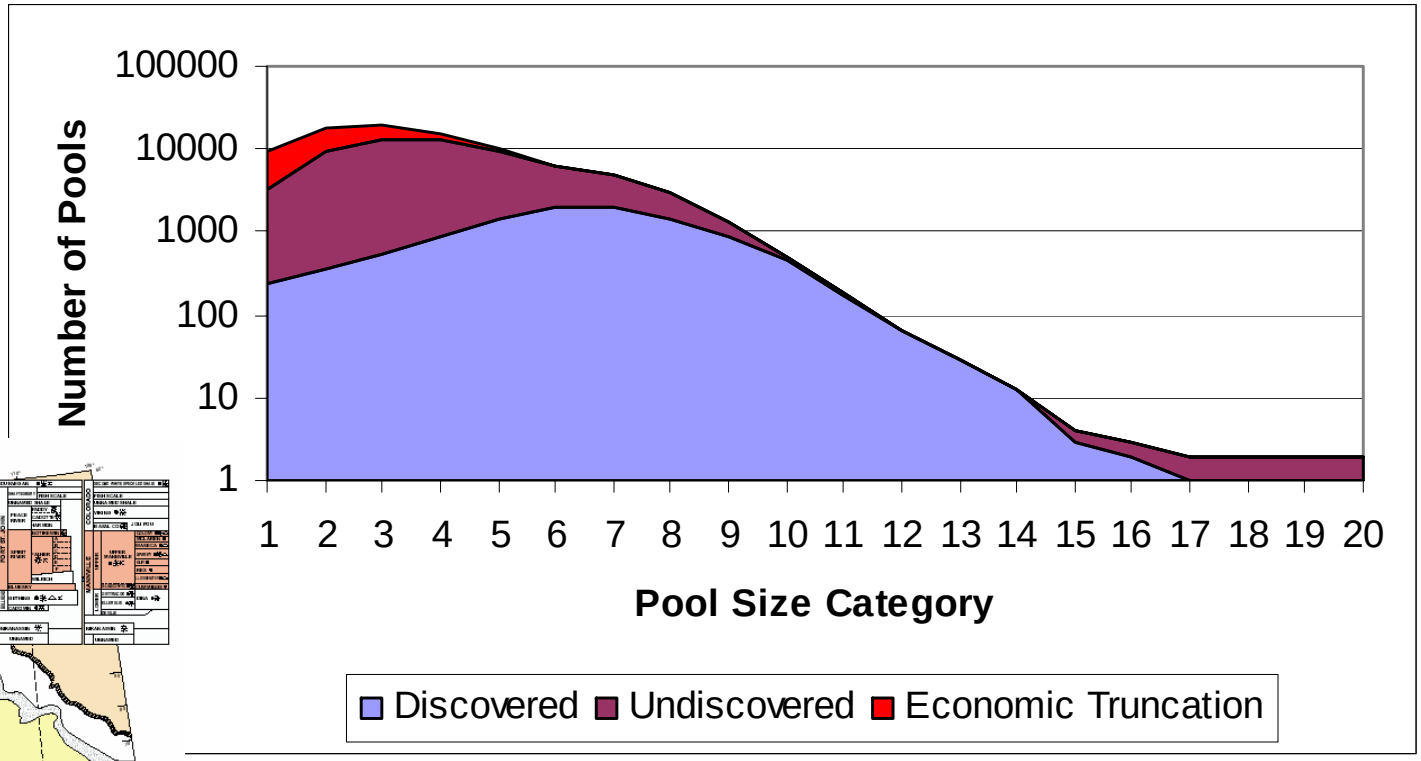
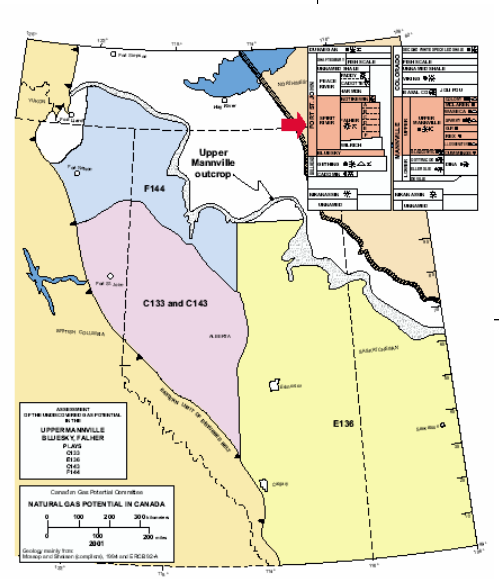
Pool Size Distribution for E136





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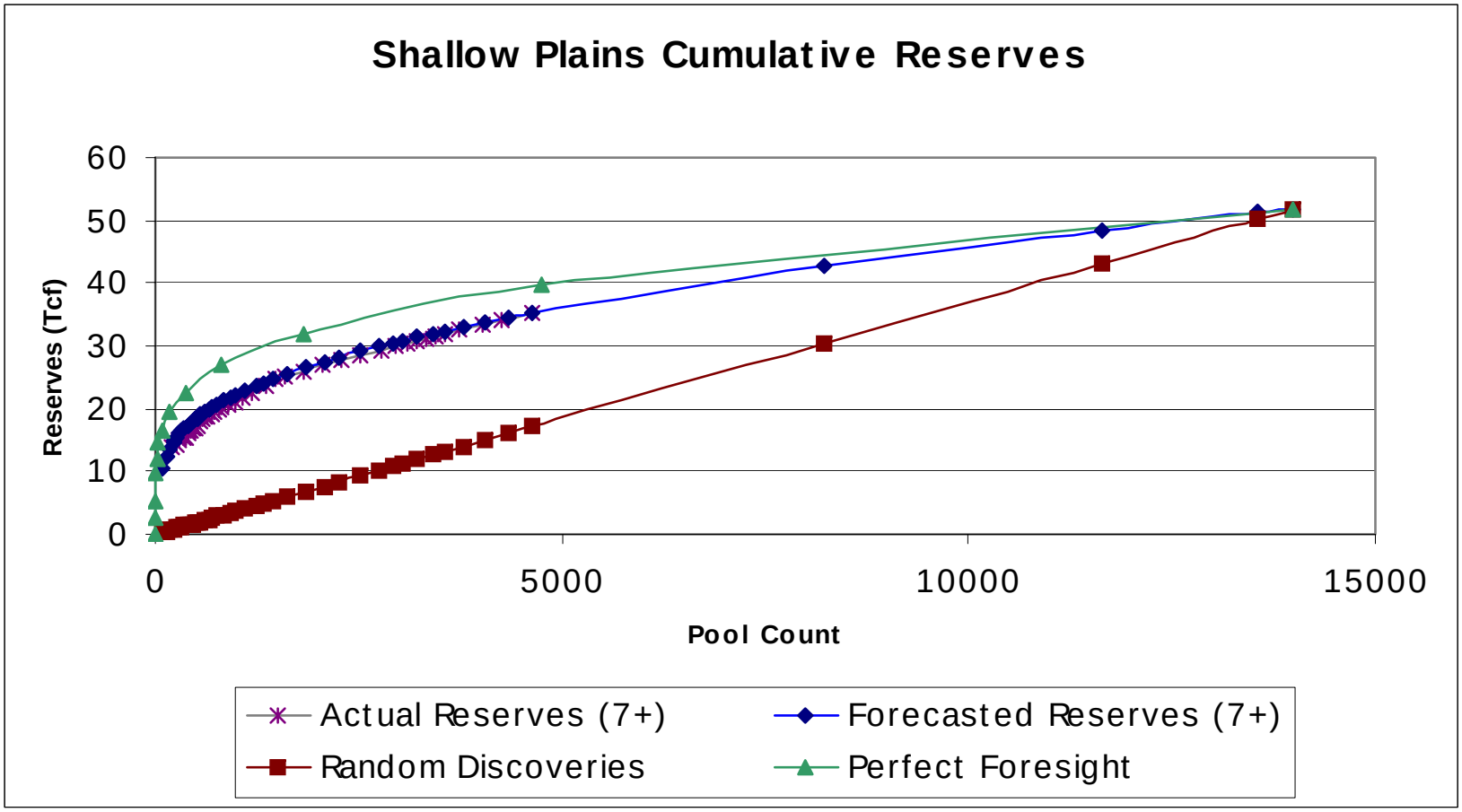
Finding Rate Analysis

- Based on historical exploration efficiency
  - Solves for the exploration efficiency, β, total number of pools, N, and lognormal parameters, μ and σ, by history matching
  - Biased Sampling without Replacement
- Integrates Arps-Roberts (both classical and double exponential versions) and Gordon Kaufman's successive sampling model that is used in PETRIMES
- Each tranche contains a distribution of pool sizes
  - not all economic

Finding Rate Model - Examples (Pool Finding Rate)



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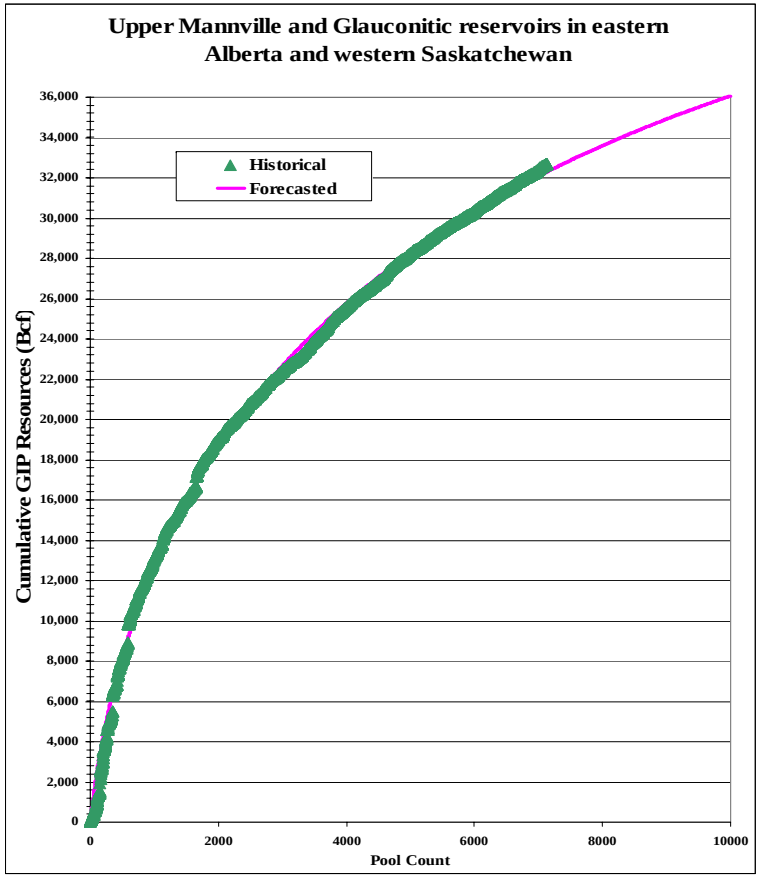
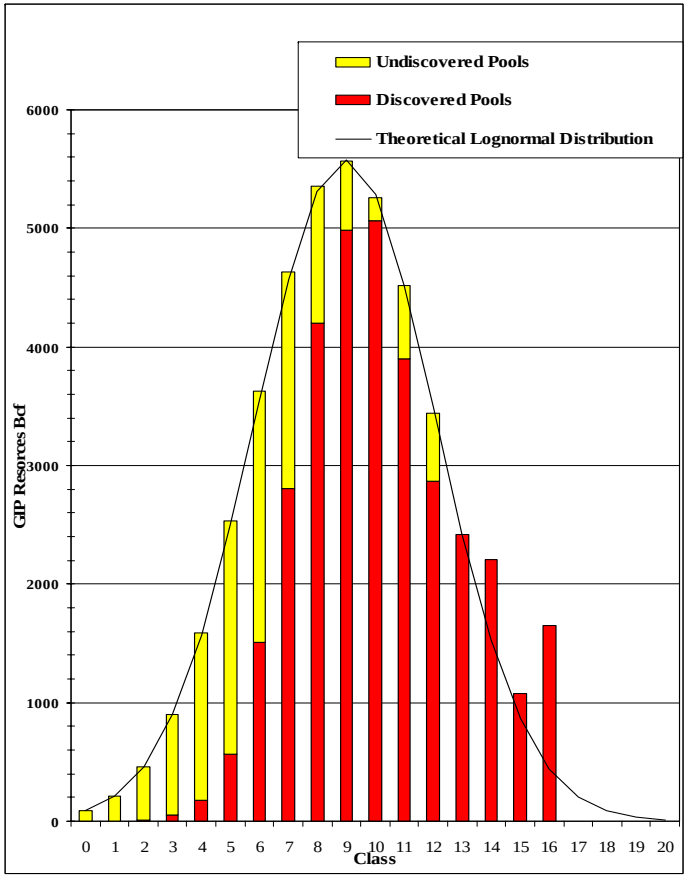
Exploration Efficiency – Low Ultimate Potential





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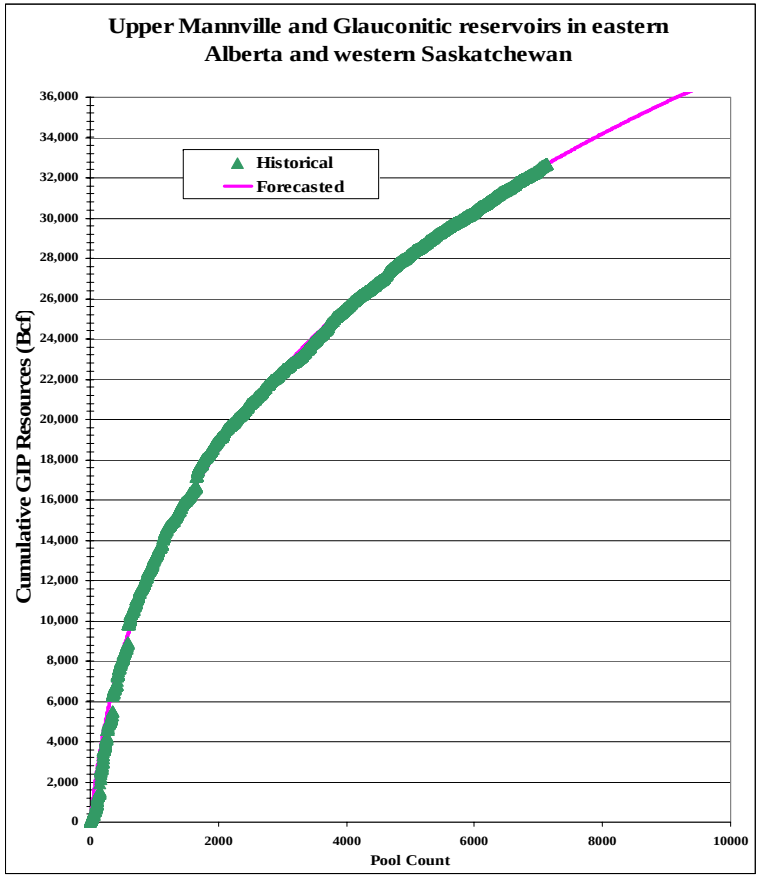
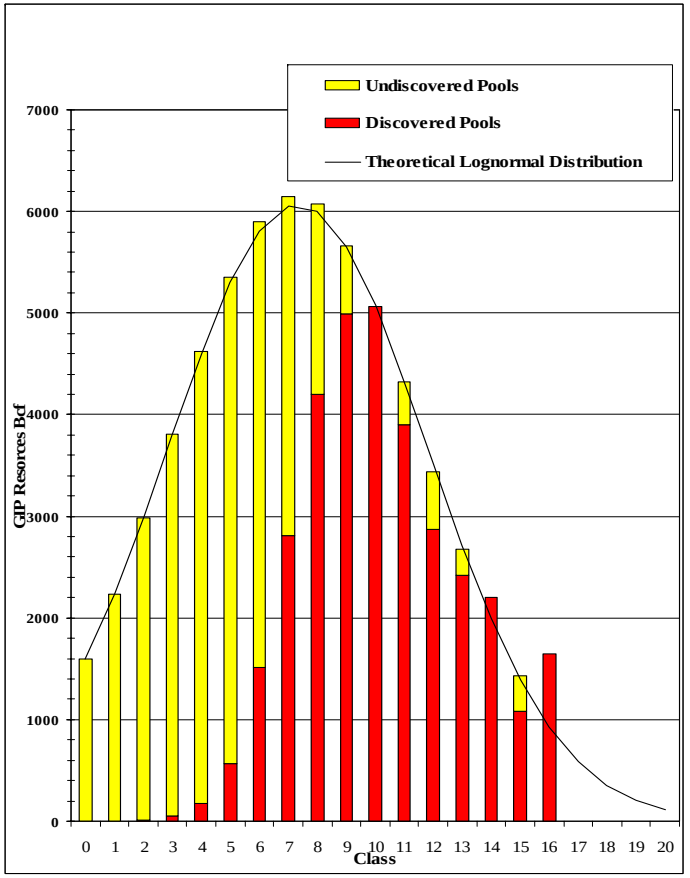
Exploration Efficiency– High Ultimate Potential





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Blended Supply Cost

- Supply cost is determined as the price needed to achieve an 8% real pre-tax and pre-royalty return on capital
- Each supply increment for supply cost calculation includes a distribution of pool sizes, not all of which will be economic
- Pools where the supply cost exceeds price (as defined above) are not connected and are considered for future connection at half cycle supply cost
- Costs assume capital, operating and D&A expenses determined by the drilling success factor and drilling development activity
- Flow assumptions from reserve additions account for connection schedule, rate of take and decline

Supply Cost Curve Architecture

Inputs

Model - By Region and/Or Play Group, M = Regions

Capital and Operating Costs By Region

Finding Rate Parameters

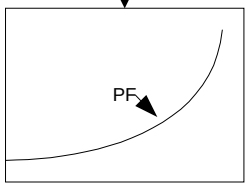
Flow Parameters

Assess Reserve Addition Supply Using: Finding Rate Model by Size Class

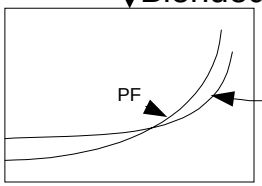
DTC must be greater than Hurdle Price for Current Increment of Reserve Addition

A Blended DTC is Calculated for all Size Classes which Exceed the Current Hurdle DTC Value
Unconnected Reserve Addition Pools are Available for Connection when the Hurdle Price is Increased to Add More Costly Supply

Perfect Foresight Assumes Largest Pools are Found First



Blended Finding Cost



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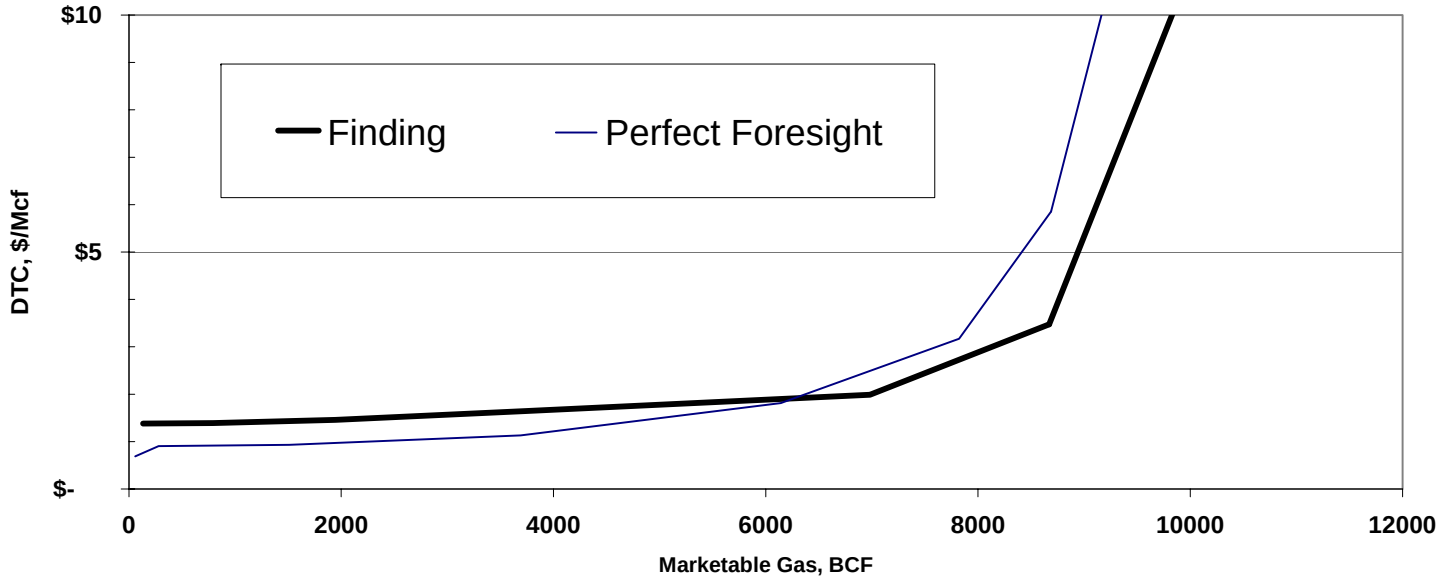
Supply Cost Curve

Perfect Forsight Versus Blended Finding Rate, Play Group E136



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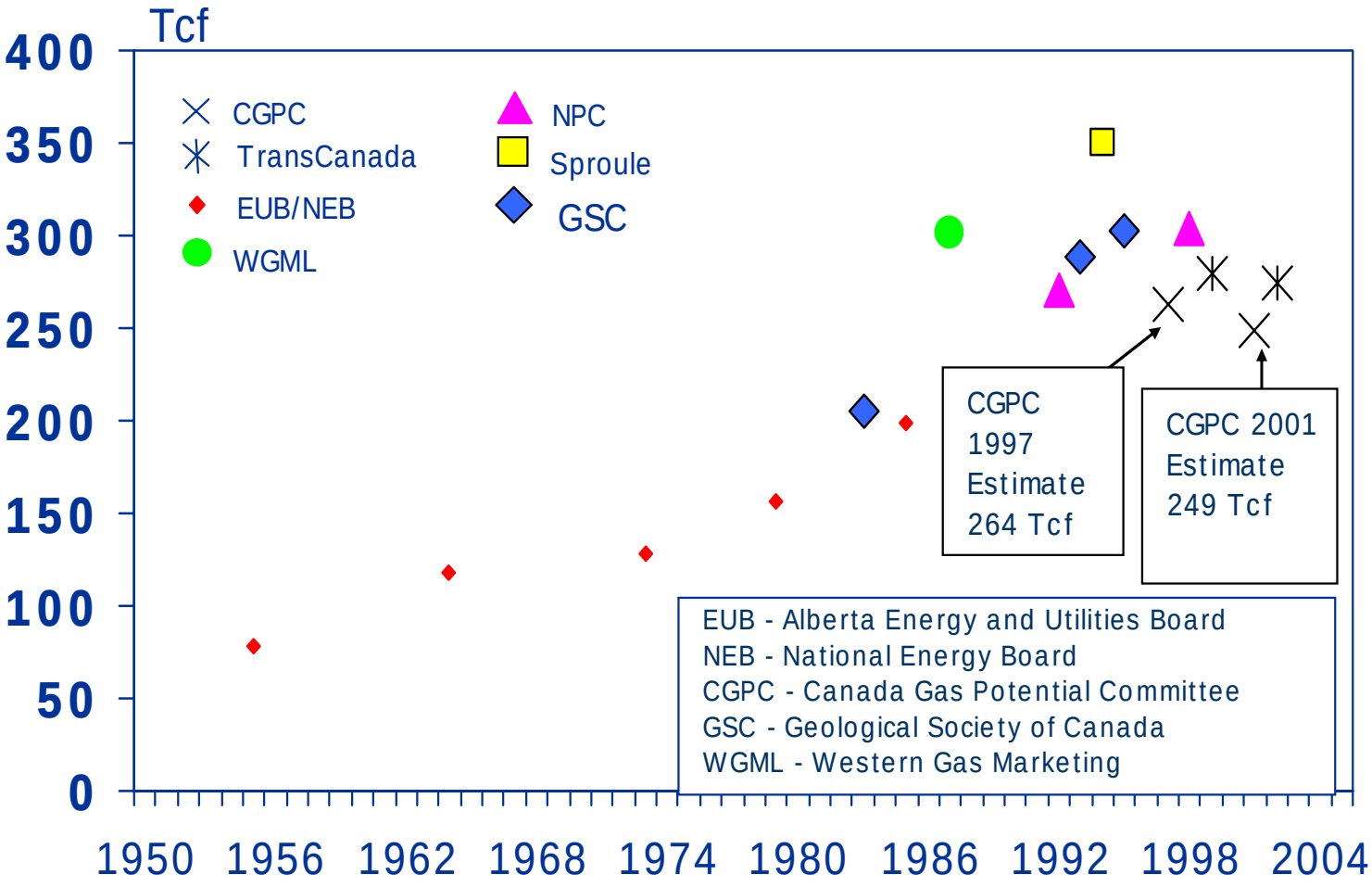
Supply Forecasting Module

- By region
- Short term – Activity based
- Long term – Blended Supply Costs Curves
- Technology adjusted price forecast
- Maximize net revenue
- Constraints
  - Activity (Rig availability)
  - Capital Spending (Reinvestment ratio)

Conclusions

- Model generated Supply Costs are closer to observed F&D and Lifting Costs
- Resulting Forecasts are lower and seem to corroborate with near term outlooks
- Slides illustrating our forecast follow

Estimates of WCSB Ultimate Potential



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WCSB Ultimate Potential Resources – Conventional (12/31/02)

	Ultimate Tcf	Discovered Tcf	Produced Tcf	Undiscovered Tcf
TCPL	275*	52.4 (19%)	133.2 (48%)	89.4 (33%)
NEB[2]	274	-	-	-
CGPC[3]	249	-	-	-
NPC[4]	304	-	-	-
CERI[5]	249-287.5			

* At $11.00 Cdn/GJ (2002). TransCanada assumes all these resources are economic in a 40-year horizon as technology improvements reduce the supply cost to approximately $5.00 Cdn/GJ (2002).

1 Based on Provincial Government year-end 2002 statistics.

2 National Energy Board, 2004, *Canada's Conventional Natural Gas Resources, A Status Report*.

3 Canadian Gas Potential Committee, 2001, *Natural Gas Potential in Canada.*

4 Report of the National Petroleum Council, 2003, U.S. Department of Energy.

5 CERI, 2003, Potential Supply & Costs of Natural Gas in Canada.

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WCSB Resources by Province (Tcf as of 12/31/02)

	B.C.	Alberta	SK	NWT/YT	WCSB
Established					
Remaining	9.0	40.2	2.7	0.4	52.4
Undiscovered					
Conventional	21.2	62.6	1.6	4.0	89.4
Coalbed Methane	3.2	52.0			55.2
Tight Gas	1.2	13.8			15.0
Total Undiscovered	**25.6**	**128.4**	**1.6**	**4.0**	**159.6**
Total	**34.6**	**168.6**	**4.3**	**4.4**	**211.9**

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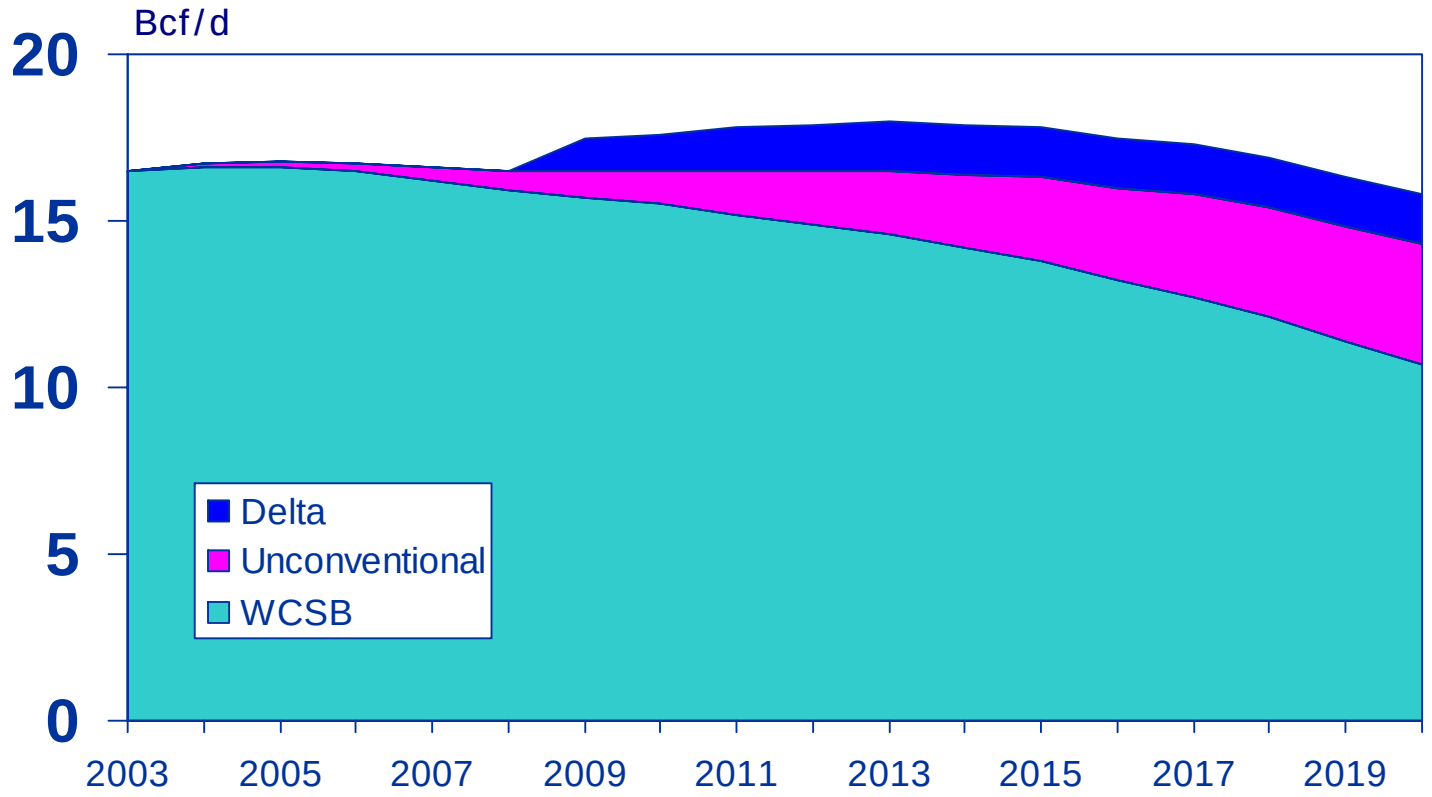
WCSB and North



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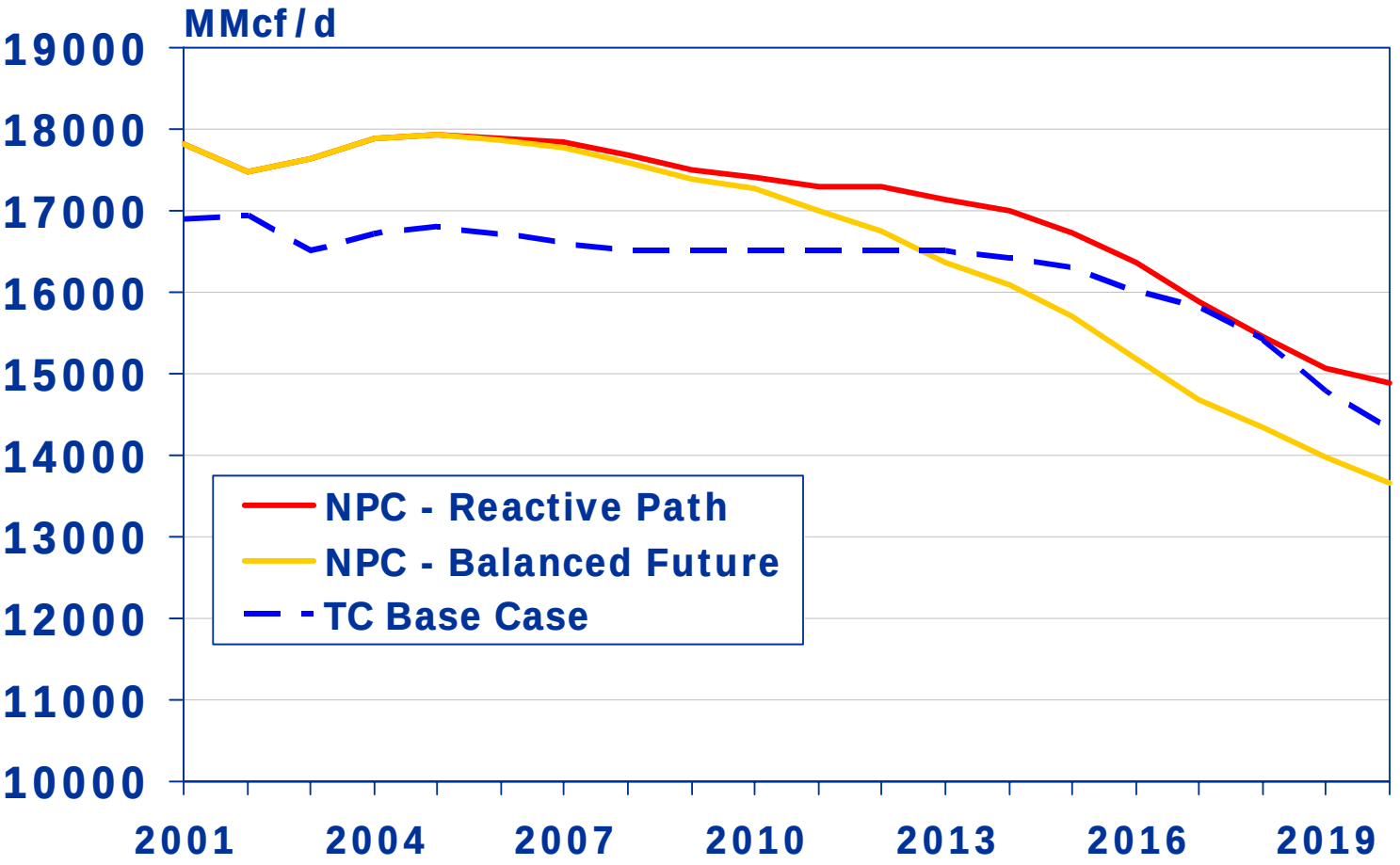
WCSB Supply – NPC Comparison



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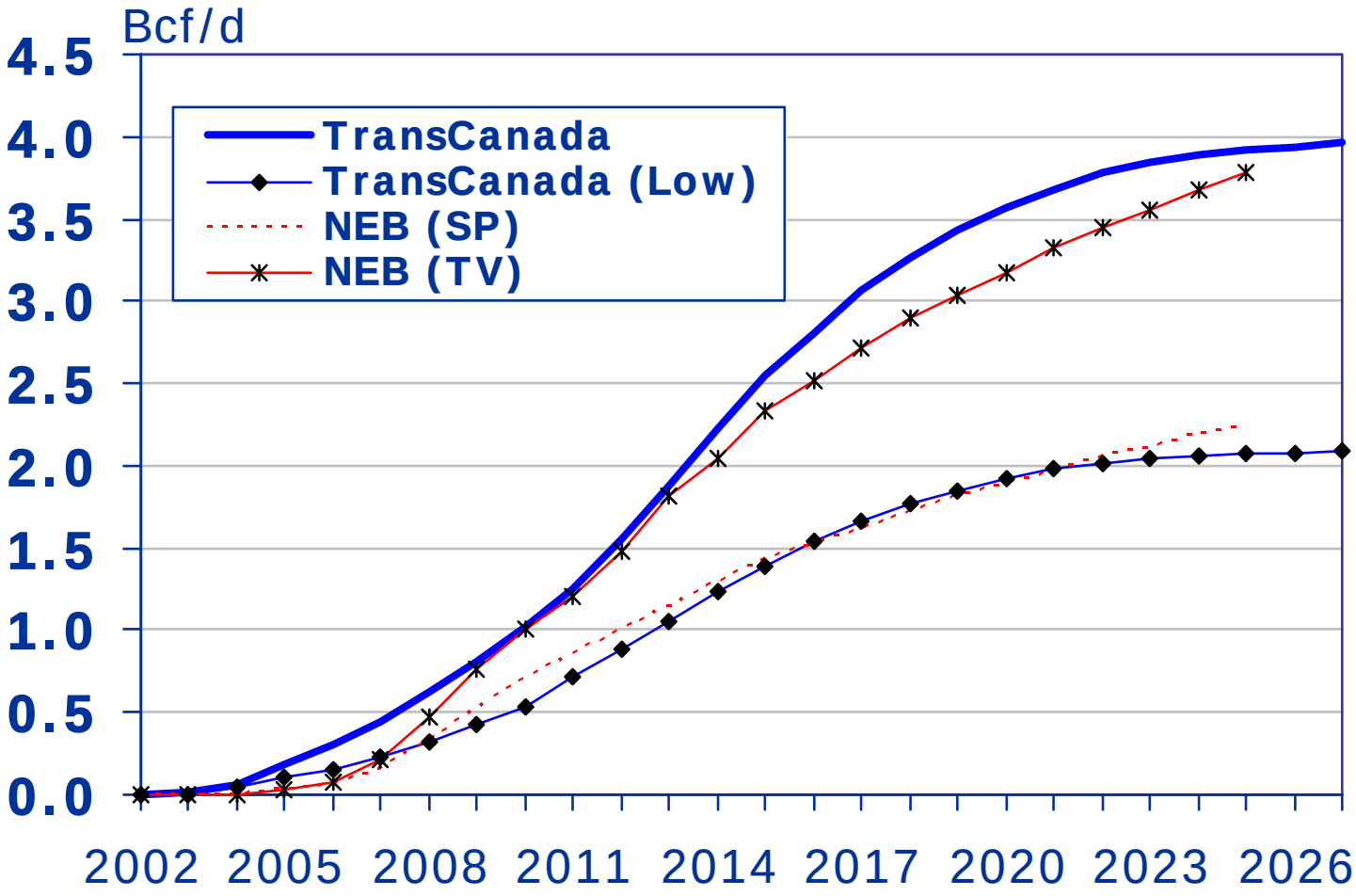
WCSB Unconventional Gas Supply Forecast



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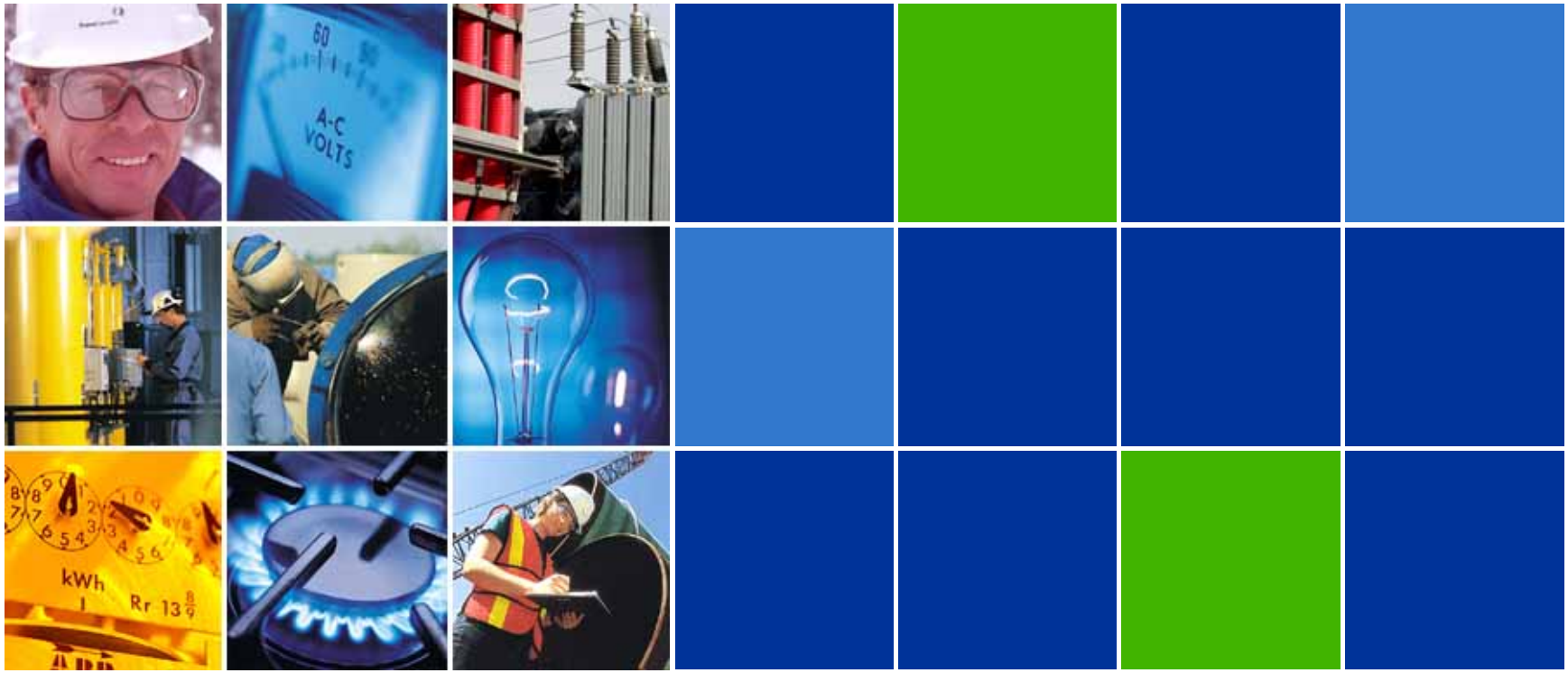

Thank you

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